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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/771,917

Filing Date: February 04, 2004

Appellant(s): SCHLAG, HARALD

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 9/26/2008 appealing from the Office action  
mailed 5/30/2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,495,278	Schmid et al.	12-2002
4,345,008	Breult	8-1982
4,501,803	Bannochi	02-1985
4,554,225	Sounai et al.	11-1985

6,309,773	Rock	10-2001
6,358,642	Griffith et al.	03-2002

The Random House College Dictionary, Jess Stein, 1980, Section C, Page 224  
(dictionary definition for channel)

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-14 and 25-38 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Schmid et al. (US Patent 6,495,278 B1).

3. In regard to claims 1, 7, 13, 25, 31, the Schmid et al. reference discloses an electrically series connected (Column 4, Line 59) MEA fuel cell with a PEM Interposed between two electrode layers with electrocatalyst interface adjacent to the PEM layer (Column 1, Lines 32-34). Each electrode has a provision of a mesh or porous fluid flow layer (Applicants' diffusion layer and also part of the MEA described by the Schmid et al. reference) between separator plates with flow channels (Column 1, Lines 60-62;

Figure 3a, Components 20 and 21) and the corresponding electrodes (Column 1, Lines 55-58). An inherent trait of a fuel cell is one electrode has to be a cathode and the other is an anode; the channels of the separator plate in the Schmid et al. reference provides the corresponding oxidant and fuel. The Schmid et al. reference discloses the MEA with the porous fluid flow layer (Column 1, Lines 55-57; Applicants diffusion layer) can be sealed on the perimeter of the separator plate (Column 1, lines 52-65) and around the perimeter of fluid manifold openings (Column 5, Lines 5-8). In Figure 5a, illustrates a first series of lands (having the flow paths to the right of the fluid manifold, the flow path to the left of the manifold and the manifold itself which are formed on a face plate 11) disposed between and separating flow channels and a sealing layer (component 50) adheres the land portions of said plate to secure direct contact between the first diffusion media and the separator.

In regard to claims 2-4, 8-10, 26-28, 32-34, the Schmidt et al. reference discloses an adhesive that can be an epoxy, electrically conductive or electrically insulating (Column 5, Lines 37-39 and 53).

In regard to claims 5, 11, 29, 35, the Schmid et al. reference illustrates the MEA in contact with a series of lands on the separator plate (Figure 3a). These lands are provided on the anode and cathode side of the MEA.

In regard to claims 14 and 38, the Schmid et al. reference discloses cooling spaces in the form as grooves on the surfaces of the separator plates are for coolant streams.

It is noted that claims 6, 12, 30, 36, are product-by-process claims. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Since the fuel cell system of the Schmid et al. reference is equivalent to that of the Applicant's, Applicant's process is not given patentable weight in this claim.

**(10) Response to Argument**

Please note when entering the word "having" into the rejection of Item 3 under **Grounds of Rejection** above, it is to further clarify the rejection. No new rejection was made.

Please also note when citing newly submitted prior art, the newly submitted prior art was not used in the body of the rejection rather it is used as evidence in rebuttal of the Applicants submitted arguments to the Examiner's rejections.

The Examiner rejected claim 1-14, 25-38 under 35 U.S.C 102/103(a) because Schmid et al. does not clearly describe a diffusion layer. One of ordinary skill in the art understands that because the Schmid reference discloses a fuel cell it has to inherently have diffusion layer to prevent the abundance of reactants in the form of fuel for the anode side and abundance of oxidant in the cathode side from cross contamination rendering the electrolyte less efficient and short-circuiting the fuel cell. The Schmid et al.

reference discloses a mesh or porous fluid flow layer in between the electrodes and the separator plate (1:55-68), but does not clarify whether the porous fluid flow layer is indeed the diffusion layer, nor does the Applicants argue this point. The Examiner is providing further evidence that these mesh and porous layer are diffusion layers to further clarify the Examiner's rejection.

A quick and very narrow search on East indicates at least 600 fuel cell patents that contain porous electrode diffusion layers in between the electrode (at times known as a catalyst with binder) and the separator (known as the fuel supply plate). To name a few of these patents found, to support the Examiners rejection based on 35 U.S.C 102(b)/103(a): The Breault reference (US Patent 4,345,008), discloses anode and cathode electrodes are of the well known gas diffusion type and each comprises a fibrous gas porous carbon substrate which may be made in any manner known in the art (Column 3, Lines 10-20); the Bannochie reference disclose a porous gas diffusion electrodes made of electrocatalyst and PTFE (Binder for the catalyst to make an electrode substrate on a porous conducting support known for use in a fuel cell electrode (Column 1, Lines 10-15); the Sounai et al. reference discloses fuel cell having a gas diffusion electrode porous bodies of a conventional structure (Col. 6, Lines 50-60 and Abstract); the Rock reference discloses porous, gas permeable, electrically conductive sheets, known as diffusion layer press against the electrode face and current collectors (Column 3, Lines 45-60), the Griffith et al. reference discloses the MEA (membrane electrode assembly) is sandwiched between sheets of porous, gas

permeable, conductive material, known as a "diffusion layer," which press against the anode and cathode faces of the MEA.

In addition to further support the Examiner's rejection, the Examiner would like to further indicate that the fluid manifold as disclosed by the Schmid reference is construed as a flow channel. The Applicants understand that the Examiner construes the fluid manifold as a flow channel (please see Non-Final Office Action dated 11/21/2007, Page 5, fourth paragraph and the clarification in Final Office Action dated 5/30/2007, Page 6) The fluid manifold supplies fluid into each fuel cell (Column 6, Lines 35-45) and therefore interpreting the claims broadly, the fluid manifold can be construed as fluid flow channel or flow channels as recited in the claimed invention. MPEP 2106 II C states "While it is appropriate to use the specification to determine what applicant intends a term to mean, a positive limitation from the specification cannot be read into a claim that does not itself impose that limitation. A broad interpretation of a claim by USPTO personnel will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended." The Random House Dictionary defines a "channel" to be a "route through in which anything passes or progresses." Hence, a fluid manifold that delivers fluid into each fuel cell can be construed as a flow channel.

4. Applicants argue, "Specifically, the Office Action characterizes elements (20) and (21) as the claimed flow channels and element (50) as the claimed sealing layer. Schmid characterizes element (5) as the membrane electrode assembly (MEA) including the PEM (2) disposed between porous electrodes (1), (3). Claims 1 and 25

*each define the sealing layer as "adhered to land portions of said plate to secure direct contact between said first diffusion media and said plate." Claims 1 and 25 each define the claimed land portions as "being disposed between and separating adjacent flow channels."* The Applicants have not fully considered the rest of the rejection in Item 6 of the Final Office action dated 5/30/2008; the Examiner further states in the rejection, " In Figure 5a, illustrates a first series of lands (the flow paths to the right of the fluid manifold, the flow path to the left of the manifold and the manifold itself which are formed on a face plate 11) disposed between and separating flow channels and a sealing layer (component 50) adheres the land portions of said plate to secure direct contact between the first diffusion media and the separator. Please note that Exhibit A, submitted by the Examiner to further clarify the interpretation of Fig. 5a in the Schmid reference, discloses the flow channels as it is recited by the claim limitation and as interpreted by the Examiner. Exhibit B, submitted by the Examiner to further clarify the interpretation of Fig. 5a in the Schmid reference, discloses the land portions disposed between separating adjacent flow channels, as it is recited by the claim limitation and as interpreted by the Examiner.

5. Applicant argues, "As indicated in Schmid, "[a]dhesive bonding agent 50, used for sealing the gas spaces, runs along the outer edges of MEA 5." (col. 6, lines 58-60). While the adhesive bonding agent (50) of Schmid may engage the MEA (5), it does so at regions outside of the flow channels (20, 21) and outside of the land portions adjacent to the flow channels. In order to better illustrate the distinction between the claims and the teachings of Schmid, Applicant has labeled what would reasonably be

*considered the land portions in Schmid in Figures 3a and 5a above. As seen in Figures 3a and 5a and explained in column 6 of Schmid, the "sealing layer 50" is not located between adjacent flow channels and adhered to the land portions as claimed. Rather, the "sealing layer 50" surrounds an outer periphery of the MEA (5)." However, to better define Fig. 5a of the Schmid reference, the Examiner has included labeled drawings of Fig. 5a denoted as Exhibit A and Exhibit B. Giving a fair reading of the Schmid reference and broadly interpreting the claim language, Exhibit B illustrates the land portions between flow channels of Exhibit A. While 50 denotes the as the adhesive agent (Applicant's first sealing layer) adhered to the land portions as indicated in Exhibit B. Furthermore, the Schmid reference discloses that the adhesive bonding agent used to seal the MEA to the adjacent separator plate around the fluid flow spaces, is located in the edge areas of MEA circumscribing the electrochemically active" and "depending on the cell design and whether or not a particular fluid is to be directed to the adjacent fluid flow space, the individual manifold openings may...have adhesive forming a seal around them (Column 6, Lines 35-47, Column 6, lines 52-55). Applicants argue" and explained in column 6 of Schmid, the "sealing layer 50" is not located between adjacent flow channels and adhered to the land portions as claimed." However these are assertions, the Examiner cannot find where the Schmid reference discloses that the sealing layer (50) is not located between adjacent flow channels. As it is indicated in Column 6, Lines 35-47, Column 6, lines 52-55, the adhesive layer may be formed around the fluid manifolds and as it is illustrated in Fig. 5a.*

Applicant argues, "Further, in response to similar arguments previously presented by Applicant and requests for clarification as to how Schmid teaches an adhesive layer adhered to the land portions of Schmid, the Office Action additionally considers element (30) of Schmid to be a flow channel. Applicant respectfully disagrees with this characterization of Schmid as Schmid clearly indicates and Figure 2 clearly shows that element (30) is a fluid manifold opening, not a flow channel as claimed. Rather, as indicated above and in the body of the rejection of the Office Action, elements (20) and (21) are properly considered the flow channels in Schmid and teach away from the interpretation of Schmid suggested by the Office Action" The Applicants acknowledged that the Examiner had included component 30 as a flow channel. The Applicants have not provided any further evidence why the fluid manifold cannot be considered a flow channel. Again, the fluid manifold supplies fluid into each fuel cell (Column 6, Lines 35-45) and therefore interpreting the claims broadly, the fluid manifold can be construed as a fluid flow channel or flow channels as recited in the claimed invention. MPEP 2106 II C states "While it is appropriate to use the specification to determine what applicant intends a term to mean, a positive limitation from the specification cannot be read into a claim that does not itself impose that limitation. A broad interpretation of a claim by USPTO personnel will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended." The Random House Dictionary defines a "channel" to be a "route through in which anything passes or progresses." Hence, a fluid manifold that delivers fluid into each fuel cell can be construed as a flow channel.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Helen Chu

/Helen O Chu/

Examiner, Art Unit 1795

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